

**AD-A278 145**



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MML TM 94-08

**COLLOCATED TUNABLE WAVENUMBER SENSOR/ACTUATORS FOR  
SMART STRUCTURES**

**N00014-92-C-0214**

**CDRL A001.18**

Covering the period: 1 March to 31 March 1994

Submitted to:

Office of Naval Research  
Scientific Officer  
Code : 1221

Submitted by:

K. Bridger  
L. Jones

**DTIC**  
**ELECTE**  
**S F D**  
**APR 14 1994**

**MARTIN MARIETTA CORPORATION**

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April 8, 1994

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**94-11085**



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## **Contract progress and activities since CDRL A001.17.**

### **Summary of progress**

- Two of the three actuators (two with Pt electrodes and one with Au/Pt/Pd electrodes) which were burned out last month have been sintered. One was broken during CIPping and was unsalvagable. The other two were sintered without CIPping. The first actuator module broke during sintering due to either sticking to the crucible during shrinking or from thermal shock. The heating schedule used was 10°C/min to 900°C, 1 hour hold, 1°C/min to 1200°C, 3 hour hold, 1°C/min to 500°C. The second actuator module was sintered at a slightly slower rate (5°C/min to 900°C, 1 hour hold, 1°C/min to 1200°C, 3 hour hold, 1°C/min to 500°C) and placed on a burned out endcap piece on the same composition as the actuator. This actuator module survived sintering without cracking (our first to date).
- Two actuator modules were made and put into burnout last month. One actuator module broke during CIPping. The second is awaiting CIPping. This actuator module can not be sintered without CIPping due to delaminations.
- One actuator module is currently in burnout.

### **Telephone calls, trips, and significant results**

- None

### **Results bearing on prior problem areas**

- As mentioned last month, we have encountered problems with the bags leaking during CIPping the actuator modules. We have experimented with larger CIPping bags. However, this was not a success. We are currently experimenting with thicker rubber tubing.

### **Programmatic changes**

- None

### **Technical or scheduling problem areas**

- None

### **Contract and cost schedule status**

- Expended funds as of 31 March 1994, including expenditures prior to 23 July, were \$246K against a current budget of \$255K.
- A revised cost schedule, beginning at the 23 July program restart, and reflecting the \$114K funding gap is attached.

### **Plans for April 1994**

- Three actuator modules are scheduled to be put into burnout this week.
- Another batch of tape will be cast with a 36% volume fraction of binder.
- Three more actuator modules will be made and put into burnout.

### **Preparers**

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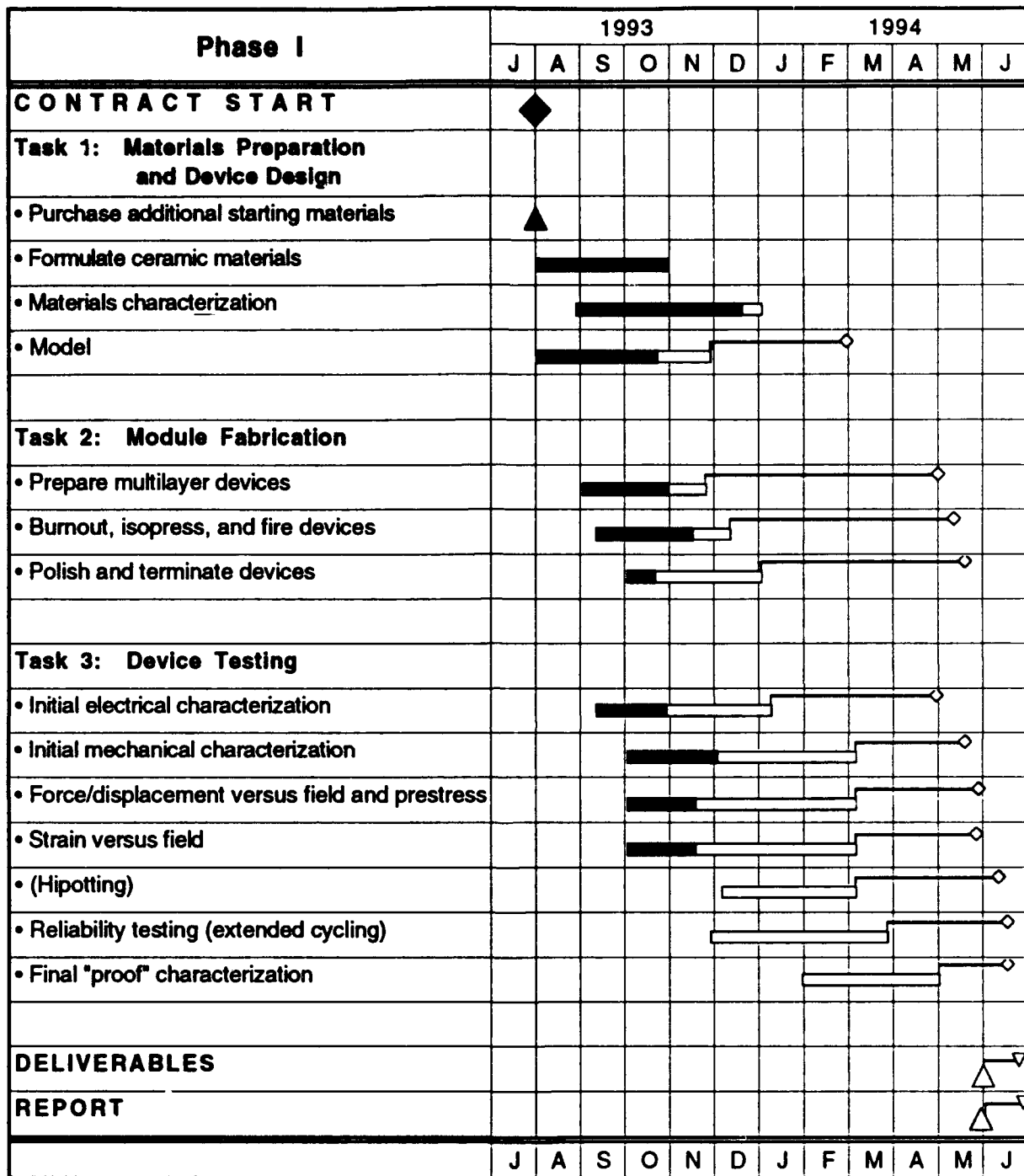
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**DTIC QUALITY INSPECTED 3**

# SCHEDULE, MILESTONES, AND DELIVERABLES -- Updated April 5, 1994



## KEY:

Milestone:



Planned task



Completed task



Task with new projected completion:

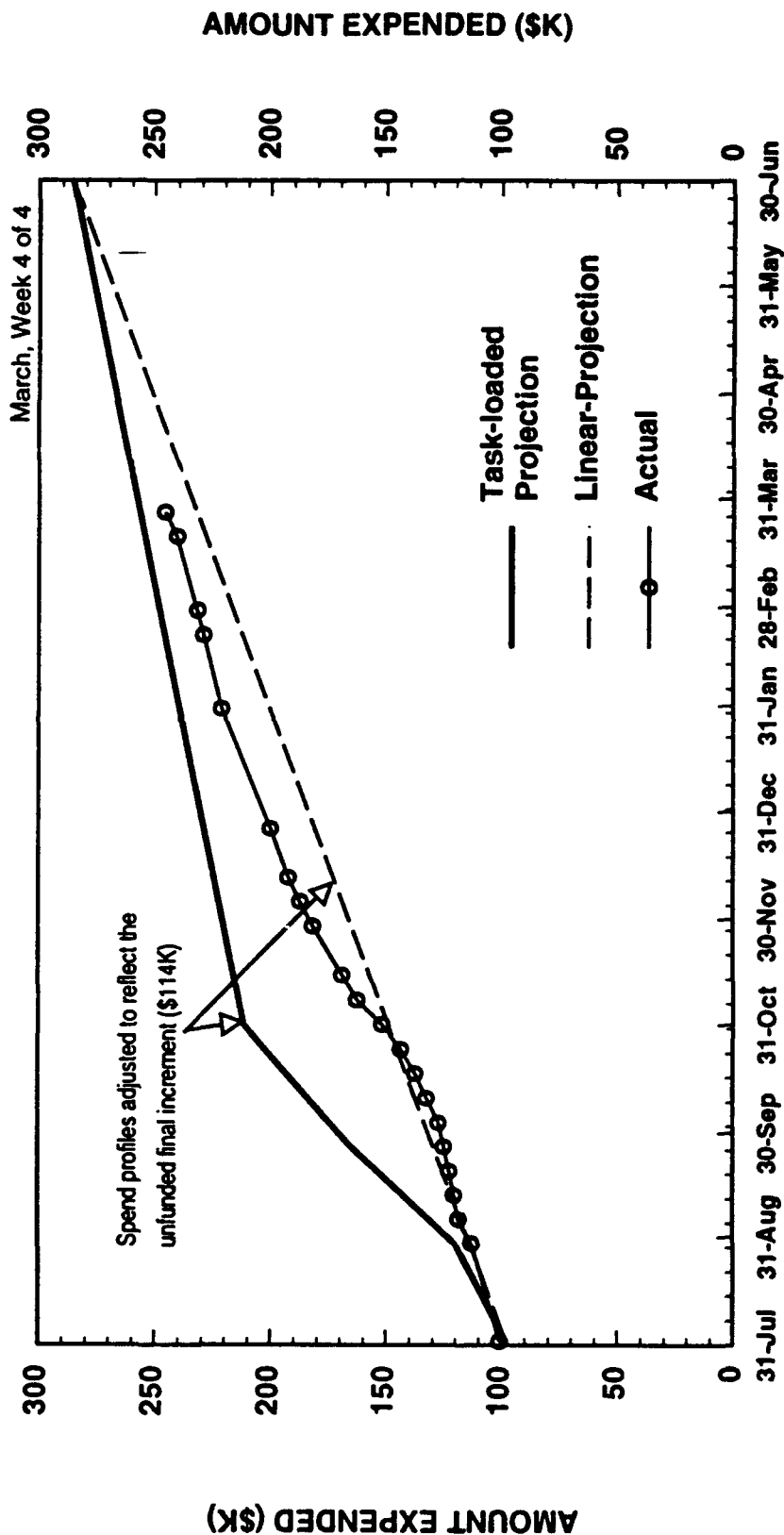


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Apr 5, 1994

# EXPENDITURE CHART

3117-000 ONR  
Co-Fired High-Force Actuators



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Unannounced		<input type="checkbox"/>
Justification		
By <u>A275872</u>		
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